REMARKS

The Official Action rejects Claims 1-16 under 35 USC § 103(b)(a) as being unpatenable over U.S. Patent No. 6,418,199 to Jeffery Perrone in view of U.S. Patent Application Publication No. US 2002/0067821, U.S. Patent No. 5,845,276 to Michael Gene Emerson et al. and U.S. Patent No. 6,314,402 to Peter C. Monaco et al. As described below, none of the cited references, taken either individually or in combination, teaches or suggests the claimed invention. As such, Applicants respectfully request reconsideration of the present application and allowance of the pending set of claims.

Claims 1-16 included independent claims drawn to methods, apparatus, systems and computer program products for visually representing user behavior within an automated response system, such as an interactive voice response (IVR) system, of a contact processing center, such as a call processing center. For purposes of example, the method of independent Claim 1 will be described in more detail and will be contrasted to the cited references for purposes of delineating at least some of the patentable distinctions therebetween. As each of the other independent claims have the same or comparable recitations to those that are set forth by independent Claim 1 but that are not taught or suggested by the cited references, the other independent claims will also be similarly patentably distinct from the cited references for at least the same reasons as described below in conjunction with independent Claim 1.

Independent Claim 1 is drawn to a method of visually representing user behavior within an IVR system of a call processing center. In this regard, the call flow of the IVR system is modeled as a non-deterministic, finite-state machine with a start state representing the first prompt of the IVR system, other states representing subsequent prompts at which branching occurs in the call flow of the IVR system and end states representing exit conditions. Transitions between the call flow states are triggered by data input by the user or by internal processing of the IVR system. In addition to modeling the call flow as a non-deterministic, finite-state machine having various states with transitions therebetween, the method of independent Claim 1 produces a two way matrix of several counters based upon the complete sequence of events by which calls can be routed through the finite-state machine. By way of example, the counters

may maintain counts of calls that proceed to or through respective states as well as the action taken by the user. By way of illustration, if a user who is currently in a respective state is presented with four choices, separate counters can identify the number of users who transition out of the state by selecting each respective option. As set forth by independent Claim 1, state-transition counters are provided for states with at least one child or subsequent state while counters representing exit conditions are provided for the exit states.

Independent Claim 1 further recites the "visually representing data from the two-way matrix as a state-transition diagram having states represented IVR system prompts and arcs representing user responses to the prompts and actions initiated by the IVR system." Thus, the state-transition diagram consisting of the states and the arcs is not merely an artificial construct, but is a diagram that visually represents user behavior within an IVR system. Thus, the state transition diagram can be displayed to a system administrator or other personnel and utilized to determine the manner in which users propagate through the IVR system. As such, portions of the IVR system that may prove to be inefficient or confusing may be identified and remedied in order to improve user experiences with the resulting IVR system.

By way of example, Figure 14 of the present application is a portion of one exemplary state-transition diagram for the initial portion of an IVR system and is reproduced below for purposes of discussion.

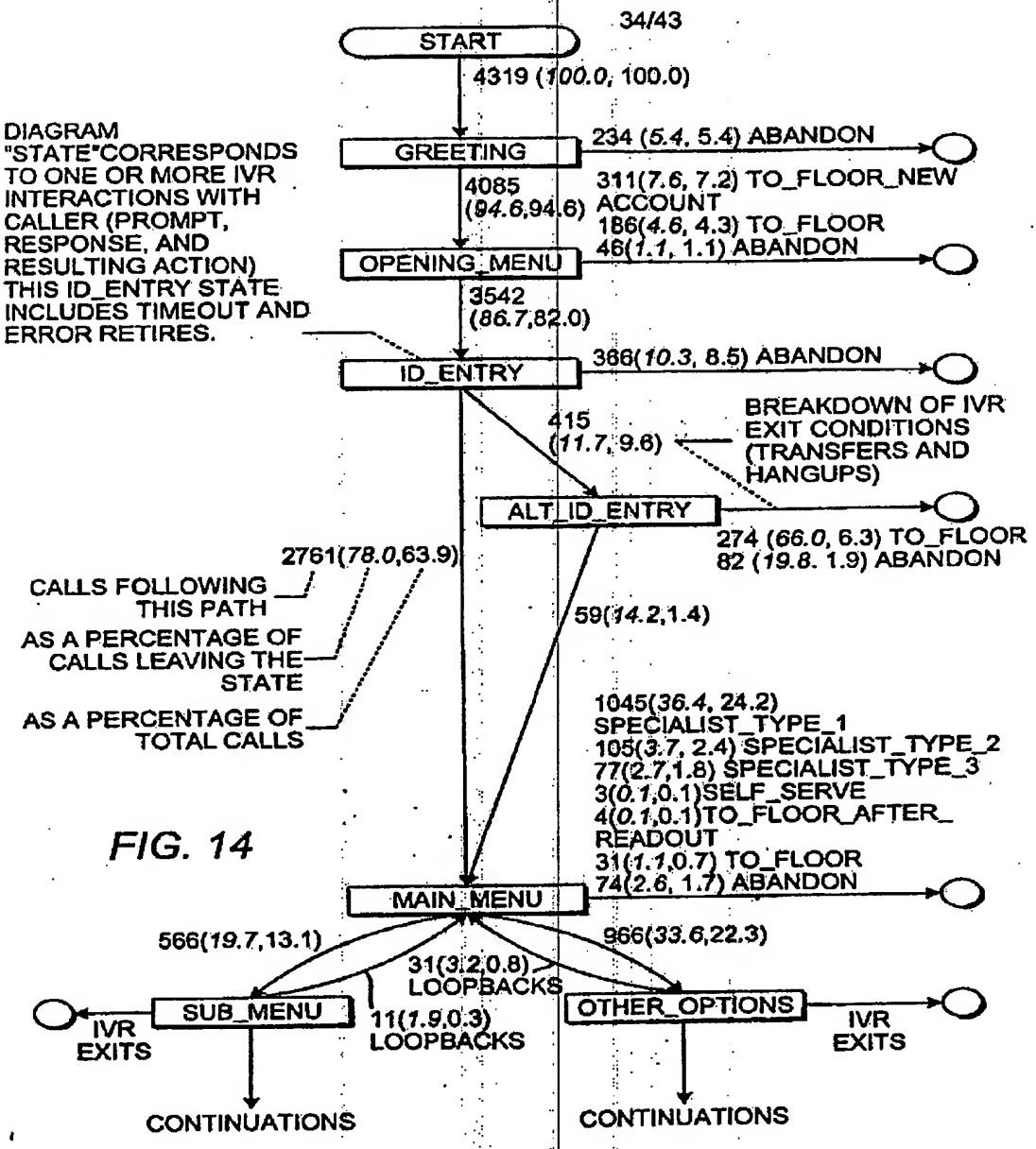

FIG. 14

With reference to Figure 14, "Start" represents a start state, while "Greeting", "Opening_Menu", "ID_ Entry", "Alt_ID_Entry", "Main_Menu", "Sub_Menu" and "Other_Options" represent other states of the finite-state machine. Additionally, the numerical values provided alongside transitions between the states represent the values tabulated by the

respective counters. With respect to the transition represented by the arc extending between the "ID_Entry" and "Main_Menu" states, the counters have identified 2761 calls that make that transition which represent 78.0% of the calls leaving the "ID_Entry" state and 63.9% of the total calls received by the IVR system. A state-transition diagram, a portion of one example of which is shown in Figure 14, would therefore be visually displayed such that a system administrator or other personnel who can evaluate the manner in which users are working through the IVR system can identify any bottlenecks or other states/transitions that appear to cause confusion.

In marked contrast to the claimed invention, none of the cited references teach or suggest the visual representation of a two-way matrix of counters as any type of state diagram, let alone a state diagram having states representing various system prompts and arcs representing various user responses. In this regard, page 5 of the Official Action cites the Monaco '402 patent for its purported disclosure of the visual representation of data from a two-way matrix as a state-transition diagram. The Monaco '402 patent describes a technique for creating Speech Objects for use in an IVR system with each Speech Object designed to acquire a particular type of information from a speaker. With respect to the disclosure of the Monaco '402 patent of a state transition diagram, the Official Action points to Figure 18 and column 34, lines 58-67 of the Monaco '402 patent. However, Figure 18 and the corresponding text do not describe the visual representation of a state transition diagram as recited by the claimed invention. While Figure 18 is a state transition diagram, the state transition diagram does not visually represent data from a two way matrix of several counters with states representing system prompts and arcs representing user responses to the prompts or actions initiated by the IVR system as recited by independent Claim 1. Instead, Figure 18 is merely a construct for purposes of aiding the reader of the Monaco '402 patent in understanding the manner in which the Speech Object is executed.

As such, the states of the state transition diagram of Figure 18 of the Monaco '402 patent do not represent IVR system prompts as recited by independent Claim 1 but, instead, represent various operational states of the platform adaptor and the dialog server. As will be apparent, these operational states have no relationship to IVR system prompts as set forth by independent Claim 1. Moreover, the two way matrix of independent Claim 1 is described to represent a two-way matrix of several counters. In contrast, the state transition diagram of Figure 18 of the

Monaco '402 patent does not visually represent data from a two-way matrix comprised of several counters as recited by independent Claim 1. In fact, the state transition diagram of the Monaco '402 patent does not depict data from any counter (not to mention a two-way matrix of counters) and, instead, merely indicates the transition from one operational state to another.

Thus, neither the Monaco '402 patent nor any of the other cited references teaches or suggests the visual representation of data from a two-way matrix as a state-transition diagram having states representing IVR system prompts and arcs representing user responses to the prompts or actions initiated by the IVR system as recited by independent Claim 1. Additionally, none of the cited references teach or suggest modeling the call flow of an IVR system as a non-deterministic finite-date machine and then producing a two-way matrix of several counters based upon the provision of the complete sequences of events for multiple calls to the finite-date machine, as also recited by independent Claim 1.

As described above, the Monaco '402 patent was cited for its purported disclosure of the visual representation of data from a two-way matrix as a state-transition diagram and was not alleged to and, in fact, does not teach or suggest modeling the call flow of an IVR system as a non-deterministic finite-date machine and then producing a two-way matrix of several counters based upon the provision of the complete sequences of events for multiple calls to the finite-date machine, as also recited by independent Claim 1.

Turning now to the primary reference, the Perrone '199 patent describes a system in which a client communicates with a server over a pair of communication channels. A voice communication channel is established between a telephone on the client side and an IVR system with a speech recognizer on the server side so as to allow the client to interact with and obtain resources from the server through voice commands. In addition to the voice communication channel, a data communication channel can be established between the client and the server such that web pages or other electronic documents can be accessed by and provided to the client. According to the Perrone '199 patent, commands issued by the client over the voice communication channel can dictate which web pages or other data is provided via the data communication channel. For example, a client can access a website via the data communication channel and then navigate through the website based upon auditory commands issued over the

voice communication channel. In no instance, however, does the Perrone '199 patent teach or suggest modeling the call flow of an IVR system as a non-deterministic finite-state machine and then producing a two-way matrix of several counters based upon the provision of the complete sequences of events for multiple calls to the finite-state machine, as recited by independent Claim 1. While the Perrone '199 patent does describe various prompts that are provided in different sequences depending upon the user responses, the Perrone '199 patent does not teach or suggest modeling the call flow of the IVR system as a non-deterministic finite-state machine. Moreover, as noted by page 5 of the Official Action, the Perrone '199 patent also fails to teach or suggest a two-way matrix of several counters and the visual representation of data from the two-way matrix as a state-transition diagram.

The Benson '821 publication is directed to method of evaluating the performance of a call center. The Benson method includes the identification of the telephone number from which a call is placed to the call center, such as by automatic number identification, and the correlation of information associated with the telephone number in a call log, such as the customer name and information relating to the order taken during the call. However, the Benson '821 publication does not teach or suggest modeling the call flow of an IVR system as a non-deterministic finite-state machine, the production of two-way matrix of several counters based upon the provision of complete sequences of events for multiple calls to the finite-state machine and the visual representation of data from the two-way matrix as a state-transition diagram, as set forth by independent Claim 1. Instead, the Benson '821 publication was merely cited for the aspect of the claimed invention relating to the generation and storage of a complete sequence of events.

Finally, the Emerson '276 patent is directed to a method and system for enhancing the query performance of direct marketing personnel and does not teach or suggest the modeling of a call flow of an IVR system as a non-deterministic finite-state machine, or the visual representation of data from the two-way matrix as a state-transition diagram, as set forth by independent Claim 1. Instead, the Emerson '276 patent was cited for its purported disclosure of a two-way matrix of several counters. While the Emerson '276 patent mentions a two-way matrix in column 19, line 25 such a two-way matrix does not include several counters and, in any event, is not produced based upon the complete sequences of events or multiple calls to a finite-

state machine that models the call flow of an IVR system as set forth by independent Claim 1. Instead, the two-way matrix described by the Emerson '276 patent merely generates a report.

Since none of the cited references, taken either individually or in combination teaches or suggests modeling the call flow of an IVR system as a non-deterministic finite-state machine and then produces a two-way matrix of several counters based upon the provision of the complete sequences of events for multiple calls to the finite-state machine that is then visually represented as a state-transition diagram having states representing IVR system prompts and arcs representing user responses to the prompts or actions initiated by the IVR system, Applicants submit that the rejection of independent Claim 1 is overcome. Since the other independent claims, that is, independent Claims 4, 7, 10 and 13-16, include similar recitations, Applicants likewise submit that these other independent claims are also patentably distinct from the cited references, taken either individually or in combination, for at least the same reasons as described above in conjunction with independent Claim 1. Thus, it is submitted that the rejection of independent Claims 4, 7, 10 and 13-16 is also overcome.

The dependent claims include the same recitations as a respective independent claim and are therefore patentably distinct from the cited references for at least the same reasons as described above with respect to the independent claims. However, the dependent claims include additional recitations that are not taught or suggested by the cited references which therefore provide additional bases of patentability. For example, since none of the cited references teach or suggest visually representing data from a two-way matrix as a state-transition diagram as set forth by the independent claims, none of the references teach or suggest providing a visual representation of a state-transition diagram in which each node "represents one of a specific prompt in the call flow of the IVR system, a prompt with re-prompts and retries, and a complete subsection of the IVR system, which represents many different prompts", as recited by dependent Claims 2, 5, 8 and 11. Additionally, none of the cited references teach or suggest providing a visual representation of a state-transition diagram in which exit conditions are represented by leaves and each of the leaves represents "one of a call resolved in the IVR system, a call transferred to a live agent, and a caller hanging up without obtaining useful information", as recited by dependent Claims 3, 6, 9 and 12.

New dependent Claims 17-20 have been added which include still further recitations that are not taught or suggested by the cited references. In this regard, new dependent Claims 17-20 recite that the state-transition diagram that visually represents the two-way matrix also visually represents the values of the respective counters, as represented, by way of example, by the numerical information provided by Figure 14 that is reproduced above. As none of the cited references teach or suggest visually representing data from a two-way matrix as a state-transition diagram as set forth by the independent claims, the cited references similarly fail to teach or suggest visually representing the values of the respective counters in the state-transition diagram.

Accordingly, Applicants submit that the dependent claims are patentably distinct from the cited references, taken either individually or in combination, not only for the reasons described above in conjunction with the respective independent claims, but also based upon the patentable distinctions provided by the additional recitations of the dependent claims themselves. Thus, it is submitted that the rejection of the dependent claims is similarly overcome.

CONCLUSION

In view of the newly submitted claims and the remarks presented above, Applicants submit that the amended set of claims is in condition for immediate allowance. As such, the issuance of a Notice of Allowance is respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 07-2347.

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Respectfully submitted,

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CERTIFICATE OF MAILING/TRANSMISSION (37 CFR 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being transmitted by facsimile to the United States Patent Office at 571-273-8300.

Dated: September 22, 2005 Signature: (Christian Andersen)